REMARKS

Applicant respectfully requests reconsideration of this application, as amended herein. Claims 27-52 were pending in the application. In this amendment, Claims 39 and 48 have been cancelled, Claims 27, 29, 30, 35-38, 40-46, and 49-52 have been amended, and no new claims have been added. Therefore, Claims 27-38, 40-47, and 49-52 are pending in the application.

Drawings

The Examiner objected to the drawings in Figure 2 because there is no reference character for elements PCSP and RDSP, which are designated in the specification. Figure 2 has been amended to include reference character for elements PCSP and RDSP, as suggested by the Examiner. Additionally, element labels for MM, RDS, and PCS were added for consistency and clarity. All the reference elements are clearly described throughout the specification, such that no new matter has been added.

Applicant has also amended Figure 3 by adding arrowheads to some of the lines to show the direction of travel of data objects as they are moved by the data processor. Again, the movement of data objects is fully described in the specification, such that no new matter is believed to be added.

Marked-up copies of Figures 2 and 3 are attached to highlight the drawing changes.

The Objections

The Examiner has objected to informalities in Claims 27, 36, 41, 45 and 50 and the claims that depend therefrom. Applicant has amended the claims as suggested by the Examiner and respectfully requests that the objection be withdrawn.

The Rejections under 35 U.S.C. § 112 ¶ 1

The Examiner has rejected Claims 37-39 and 46-48 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Applicant respectfully traverses the rejections. As Claims 39 and 48 have been canceled, it is respectfully submitted that the rejection is now moot with respect to those claims. For Claims 37, 38 and 46, 47, the Examiner's attention is directed to page 21, paragraph 4 and page 22, paragraph 1 of the specification where movement of data objects within the same data storage section is described for finer discretesation. The use of read/write access count is described on page 9, paragraph 2. Furthermore, Figure 3 illustrates movement of data objects between page cache sections and

resident data sections.

Claims under 35 U.S.C. § 112 ¶ 6

The Examiner has indicated that the various "means" elements in Claims 36-52 are not considered limitations under 35 U.S.C. 112, sixth paragraph. Applicant has amended the claims to describe claim limitations more accurately.

The Rejections under 35 U.S.C. § 103(a)

The Examiner has rejected Claims 27, 29-36, 41-45, and 50-52 under 35 U.S.C. 103(a) as being unpatentable over prior art in view of Christenson et al., U.S. Patent No. 6,324,620. Applicant respectfully traverses the rejections.

The Christenson et al. patent relates to a direct access storage device (DASD) data management and partitioning system based on frequency utilization and capacity. Christenson et al. propose to manage data on a plurality of so-called DASD units, i.e. mass storage devices, such as floppy disk drives or hard disks, and to monitor portions of data on a plurality of DASD units to determine the number of times data is accessed within any given time period. Data are moved between the DASD units into two partitions based upon its access frequency characterization and the utilization factors of those DASD units. Christenson et al. is concerned with hard storage devices. The prior art, as described in the specification background, is concerned with obtaining a data object from the DASD and storing it temporarily in volatile memory for use by an application. The first independent claim, Claim 27 has been amended to point out that the memory acted upon by the present invention is the processor memory and the memory is partitioned into at least three discrete partitions. Nothing in the prior art suggests partitioning the volatile, processor memory; and nothing in Christenson et al. suggests that the partitioning can be performed on the processor memory. Absent the present invention, there is no motivation or suggestion to combine the references.

Christenson et al. describe only two partitions established according to the average frequency for access to data. The Examiner states that each of the two partitions in Christenson et al. has an upper threshold and a lower threshold. Applicant respectfully disagrees. With only two partitions, there is no upper threshold for the "hot" data and no lower threshold for the "cold" data. There is merely a single differentiation between "hot" and "cold". In the present invention, the partitions are established for predetermined frequency ranges wherein each

frequency range has an upper and lower threshold value. These threshold values are not determined in dependence of access frequencies to data objects, but are pre-assigned to different storage sections of the secondary memory unit. Therefore, according to a comparison of the different values for each and every frequency range and related access frequencies to data objects, it is possible to move data objects within the processor memory and not between external slow mass storage devices in cooperation with a computing system.

Additionally, the frequency ranges corresponding to each and every data storage section achieve a 'scaling' of data object on a 'temperature scale' contrary to the hard classification of a data object being either "hot" or "cold".

Furthermore, while the prior art discusses the occurrence of "hot", "warm", and "cold" pages, it also discusses the problem with such pages, because the prior art requires the complete page to be stored in the processor memory. Even Christenson et al. describes manipulation of storage of an entire page. Nothing in the combination of the prior art and Christenson et al. solves the problem of whole page data storage. The present invention solves the problem of rapid access to particular data objects by enabling storage of less than the entire page based upon access frequencies of a specific data object. Therefore, the present invention avoids the problem of complete page storage in a page cache memory section enabling significant improvement of memory management, which aspect is not taught or suggested by Christenson et al. separately or in combination with the prior art. Only from the teaching of the present invention can it be realized that less than the entire page can be stored in the manner described, and only from the teaching of the present invention can it be realized to partition the processor memory into a plurality of data storage sections having predetermined upper and lower threshold values for access frequency. There is no motivation or suggestion to combine the references to achieve this result.

Accordingly, the present invention enables more discrete determination of access frequencies for a wider variety of data, thereby enabling more efficient usage of processor memory space and a reduction of the access time to frequently used data objects. The present invention enables a multi-level shuffling of data objects between different data storage sections according to establishment of a relation between a read/write access frequency and predetermined frequency ranges in correspondence to different data storage sections. As the

prior art in combination with Christenson et al. neither teach nor suggest such a system as claimed, Claims 27, 29-36, 41-45, and 50-52 are patentably distinguished.

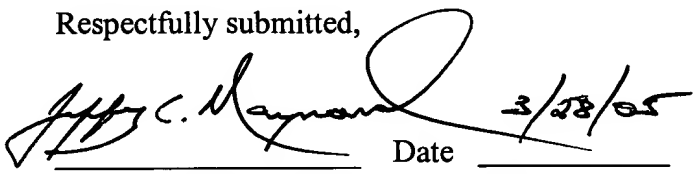
The Examiner has rejected Claims 28, 40, and 49 under 35 U.S.C. 103(a) as being unpatentable over prior art in view of Christenson et al., U.S. Patent No. 6,324,620 in view of Miyazaki, U.S. Patent No. 6,385,697. Applicant respectfully traverses the rejections.

As described above, there is no motivation or suggestion to combine the teachings of the prior art and Christenson et al. Accordingly, as described above, the present invention is patentably distinguished. As Claims 28, 40, and 49 depend from patentably distinguished claims, it is respectfully submitted that such claims are patentably distinguished as well.

CONCLUSION

Applicant has made a diligent effort to address the objections and rejections identified by the Examiner, and respectfully submits that the outstanding objections and rejections in the Office Action have been overcome. In view of the above amendments and remarks, all pending claims are believed to be patentable, and thus, the case is in condition for allowance. Accordingly, a Notice of Allowability is respectfully requested at the Examiner's earliest convenience. In the event that there is any question concerning this response, or the application in general, Applicant respectfully requests that the Examiner contact Applicant's attorney at the telephone number listed below so that additional changes may be discussed.

Respectfully submitted,



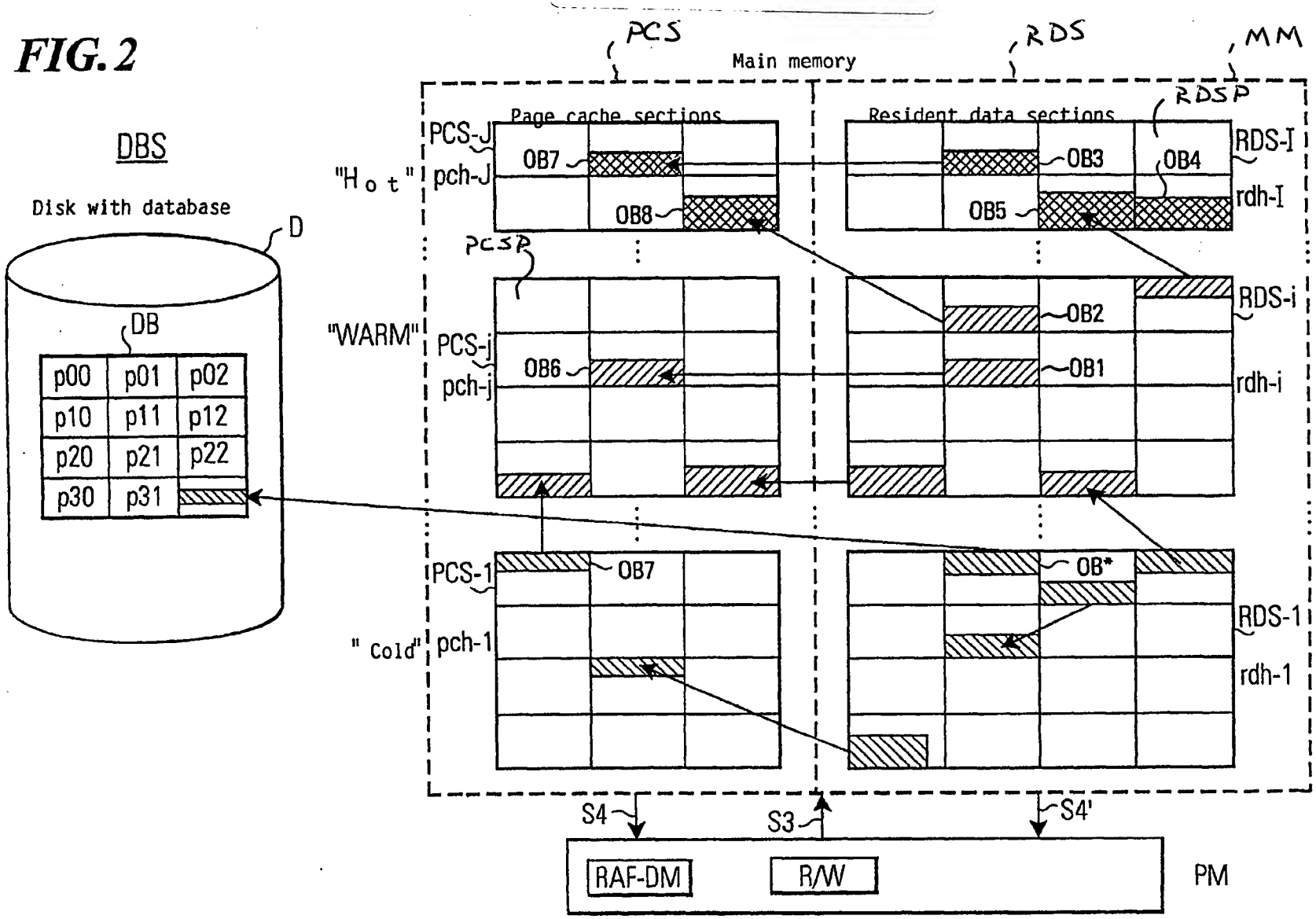
3/28/05

Date

Jeffrey C. Maynard, Reg. No. 46,208
Attorney for Applicants
WHITEFORD, TAYLOR & PRESTON L.L.P.
Seven Saint Paul Street
Baltimore, Maryland 21202-1626
Phone: 410-347-9496
Fax: 410-347-9414

ANNOTATED MARKED-UP
DRAWINGS

FIG. 2



ANNOTATED MARKED-UP
DRAWINGS

FIG.3